186 Testicular Pain

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Definition

Acute pain in one testicle in patients under age 25 is considered a surgical emergency. Failure to correct spermatic cord torsion with testicular ischemia within 2 to 4 hours can result in loss of testicular function and testicular atrophy.

Torsion of the spermatic cord (testicular torsion) is most commonly confused with infectious epididymo-orchitis and with torsion of the testicular and epididymal appendices. Thirty percent of seminomas, teratomas, and embryonal cell carcinomas of the testes also present with unilateral pain and tenderness of a testicle, but tumor-related pain is more gradual in onset and initially of less intensity than that seen with acute torsion. Table 186.1 summarizes the incidence of conditions causing acute testicular pain in selected age groups.

Technique

The history establishes the nature of onset, quality, duration, intensity, and precipitating and relieving factors, just as with pain in other locations. Open-ended questions followed by increasingly closed-ended or more specific questions will elicit these points. The occurrence of associated symptoms, such as fever or discharge, is helpful in differentiating the causes of acute and chronic constant testicular pain that are enumerated in Tables 186.2 and 186.3.

Radionuclide scanning is useful in these patients:

- To rule out torsion of the testicle, which produces a "cold" scan (predictive value negative 96 to 100%; predictive value positive 75%). False positives ("cold" scans) may be caused by hydroceles, hematomas, and hernias with trapped bowel
- To diagnose a testicular abscess
- To diagnose testicular rupture or torsion in trauma victims
- To diagnose epididymo-orchitis ("hot" scan)
- To evaluate the testicle in patients with a normal physical examination and associated emotional problems. Radionuclide scans may miss lesions 1 to 1.5 cm in size.
- To differentiate a missed torsion from a testicular abscess

Modern ultrasound scans have better resolution and may detect lesions smaller than 1 to 1.5 cm. In summary, radionuclide angiography can identify cases of torsion (cold scan) or epididymo-orchitis (hot scan). A hydrocele, hematoma, or hernia may cause decreased isotope uptake and mimic testicular torsion.

Basic Science and Clinical Significance

Testicular torsion is rare above age 30; only 50 cases have been reported in the literature. Epididymo-orchitis is uncommon below age 14.

In *testicular torsion* (torsion of the spermatic cord), a sudden onset of pain, swelling, and retraction of the testis occurs with the testicle frequently, but not always, found high in the scrotal sac. There may have been recurrent attacks in the past. The Doppler scan may show absence of pulsatile blood flow, and the radionuclide scan will show lack of isotope uptake in the affected testis. Failure to operate within 2 to 4 hours after the onset of pain will result in testicular damage. Recently, immunologic mechanisms have been in-

Table 186.1
Prevalence of Diagnoses in Patients with Acute Scrotal Pain[a]

	Testicular torsion		Appendiceal torsion		Epididymitis		Total
Age range	*N*	%	*N*	%	*N*	%	*N*
A. Cranston and Moisey (1983)							
0–10	9	(38)	12	(50)	3	(12)	24
11–20	116	(78)	20	(14)	12	(8)	148
20–30	22	(52)	0	(0)	20	(48)	42
B. Goulbourne et al. (1984)							
0–10	22	(52)	5	(13)	15	(35)	42
11–20	160	(72)	22	(10)	40	(18)	222
20–30	50	(33)	0	(0)	100	(67)	150

[a]The table summarizes prevalence data for patients with acute severe testicular pain. This presenting symptom is most commonly seen after age 10. Appendiceal torsion rarely occurs after age 18. Testicular torsion is most frequent in the second decade, but cases occur in the 20 to 30 age group as well. Epididymitis is most common in sexually active males. It is the most common cause of testicular pain after age 20, while testicular torsion is the most common cause of pain in the 10- to 20-year-old age group.

Table 186.2
Differential Diagnosis of Acute Unilateral Testicular Pain

Torsion of the spermatic cord (testicular torsion)
Epididymitis and epididymo-orchitis
Testicular abscess
Torsion of the testicular appendices
Trauma of the testis with formation of a hematoma, rupture or posttraumatic torsion
Testicular tumors
Viral orchitis
Postvasectomy pain
Idiopathic orchialgia (possibly psychogenic or posttraumatic)
Ureteral colic
Prostatitis
Sexual arousal-related orchialgia
Incarcerated inguinal hernia
Rare causes of testicular pain
Local testicular disorders
Lyme disease
Polyarteritis nodosa
Testicular leukemia
Drug-related (mazindol)
Cremasteric spasm
Referred pain
Genitofemoral neuritis
Ilioinguinal neuritis
Gluteal nodular fibrositis
Iliac artery aneurysm
Acute appendicitis

criminated in loss of fertility in the contralateral testis following unilateral torsion and partial testicular infarction or ischemia. Therapy requires correction of the torsion and bilateral orchidopexy to prevent recurrence.

Figure 186.1 shows the alternative approaches to management. Some surgeons refuse to rely on radionuclide scans and immediately explore the scrotal sac of all young men presenting with a painful, tender scrotal swelling. Such an approach may lead to nearly 80 to 90% testicular salvage but unnecessary surgery for 50% of those operated on. Use of scans and new computer-diagnostic programs may allow more selectivity for surgical exploration, but the selective approach to a painful, tender scrotal mass is still controversial, since up to 4% of salvageable testes may be missed.

In *epididymo-orchitis*, dysuria, frequency, suprapubic, perineal, and penile discomfort may precede testicular pain and swelling. The urine may be normal or show pyuria (48%). The epididymis alone or both the testis and epididymis may be swollen and tender. Localized focal epididymal tenderness may occur. Fever and chills (35%) can occur, and the onset may be acute (51%) or insidious. The causes are infection with sexually transmitted organisms such as the gonococcus or *Chlamydia trachomatis*, both usually responsive to doxycycline. Coliform bacteria may also be causative and are most common in men above age 35. Recurrent attacks can occur.

Testicular abscess can complicate epididymo-orchitis or torsion and requires surgical drainage. It can be suspected from the radionuclide scan and a prolonged course in a patient presenting with the symptoms and signs of epididymo-orchitis.

Torsion of a testicular or epididymal appendix is rare after age 18 and is most common before puberty. Intense pain occurs at the upper pole of the involved testis and a firm, tender 0.5 to 1.0 cm nodule can be felt. The ischemic appendix is purple and, when viewed through the scrotum, produces a "blue dot" sign. Once diagnosed, this disorder has been successfully managed by nonoperative means. In 15% of patients surgery has been required because of persistent pain. A reactive hydrocele, scrotal edema, redness, and testicular and epididymal swelling may develop and make accurate diagnosis impossible without surgery. The major risk is in missing a case of testicular torsion, since torsion of a testicular appendix will usually resolve spontaneously.

Testicular blunt trauma may cause hematoma and contusion, rupture of the testis, or secondary torsion and infarction. Acute scrotal swelling from blunt trauma should be studied by radionuclide angiography and explored for rupture or torsion.

Thirty percent of patients with *testicular tumors* present with testicular pain, tenderness, and swelling. This is most common with teratomas, but also occurs with seminomas and embryonal carcinomas. Radionuclide scans may be "hot" or show a halo effect similar to that seen with an abscess or a missed torsion. Surgical removal, radiotherapy, and chemotherapy are required.

Viral orchitis may occur with mumps, with salivary gland involvement, and with rubella and coxsackie viral infections. Orchitis also occurs with chickenpox, some echovirus infections, dengue, and lymphocytic choriomeningitis. Analgesics and scrotal support are required for symptomatic relief until the testicular pain and tenderness resolve in 1 to 8 weeks.

A small number of patients develop testicular pain within months or years after vasectomy. In some patients, *postvasectomy pain* is associated with a tender sperm granuloma at the vasectomy site. In others, it is associated with epididymal swelling and tenderness. These pains are increased by ejaculation and can be relieved by vasovasostomy, which restores fertility and reduces the high back-pressure in the vas and epididymis. Excision of painful sperm granulomas at the vasectomy site brings relief without restoring fertility to patients with painful vasectomy site granulomas.

A number of patients explored for testicular pain and tenderness have apparently *normal-appearing testes*. The cause of their pain and tenderness remains undetermined, but such cases are found in most surgical series.

Ureterolithiasis may present with hematuria, flank and lower abdominal pain, testicular pain, and a positive intravenous pyelogram. Microscopic hematuria is more common than gross hematuria. Such stones usually pass down the

Table 186.3
Differential Diagnosis of Chronic Constant Testicular Pain

Psychogenic causes
Neuralgia of the genitofemoral or ilioinguinal nerve
Iliac artery aneurysm
Constrictive albuginitis: Scrotal pain occurs bilaterally and is intermittent; there is infertility and small, hard, firm testes; surgical therapy, involving decompression of the tunica albuginea, usually relieves the testicular pain and improves the semen quality
Localized tenderness and pain with apparently normal testis and epididymis: Some of these cases respond to use of a testicular support; others do not, and some patients become addicted to analgesics
Inguinal hernia: A small, indirect inguinal hernia may compress the genital branch of the genitofemoral nerve; hernia repair may relieve symptoms

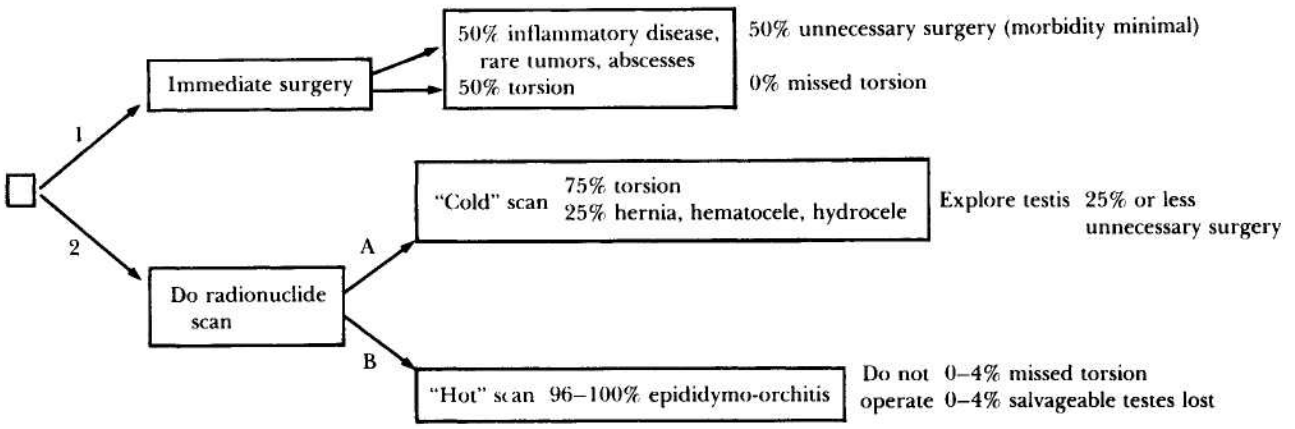

Figure 186.1
Approach to treatment of acute pain (less than 2 hours' duration), tenderness, and swelling of one testicle in a patient under age 25.

Strategy 1: All patients with painful, tender testicular swelling are explored. Fifty percent will have torsion and 50% will have epididymo-orchitis, torsion of an appendix, or a rare testicular tumor.

Strategy 2: Do scan prior to exploration. Explore only those with a "cold" scan. (A) Such an approach will miss up to 4% of cases of torsion. False positives leading to exploration because of a "cold" scan are hydroceles and incarcerated hernias. The latter also require surgery. This strategy reduces the number of unnecessary explorations. Since the false negative rate is 0 to 4% for detection of torsion, failure to explore all cases as soon as possible may lead to misdiagnosis in as many as 4% of patients presenting within 2 to 4 hours with severe pain in one testis due to torsion. The chief cause of loss of testicular function is delay by the patient or physician beyond 4 hours before considering scans or surgery. This accounts for 20% of salvageable testes being lost.

ureter and out in the urine, since testicular pain occurs with stones in the lower ureter.

Prostatitis causes urinary frequency, urgency, penile discomfort, dysuria, and perineal and testicular aching as well as lower abdominal pain. The diagnosis can be made by examination of the first ounce of a voided early morning urine or by massage of the prostate to obtain prostatic fluid. The latter procedure should be avoided in acute prostatitis because of the possibility of producing bacteremia.

Sexual arousal orchialgia may occur after heavy petting in young males. It can be relieved by ejaculation.

A small *incarcerated inguinal hernia* can cause inguinal and testicular pain by compression of the genital branch of the genitofemoral nerve.

Lyme arthritis follows a tick bite that causes infection with *Borrelia burgdorferi*, a spirochetal organism. Fever, disabling arthritis, and a distinctive skin rash characterize this disorder, which now occurs in many geographic regions in the United States.

Polyarteritis nodosa very rarely may present with bilateral testicular pain and tenderness as well as testicular induration. Biopsy of a tender indurated area may reveal the diagnosis in 80 to 90% of cases. Only 2 to 18% of patients with this disorder have orchialgia, while biopsies in 36 to 86% of testes in patients with polyarteritis nodosa are abnormal.

Testicular involvement by leukemia causes bilateral enlargement and sometimes pain and tenderness. Six to 36% of leukemic patients have clinical evidence of testicular disease. Hepatic, splenic, and nodal involvement are frequent associated findings. In one series of acute lymphoblastic leukemia, the clinical incidence of testicular involvement was 9%.

The most frequent cause of *drug-related testicular pain* is mazindol, a drug used to promote weight reduction. In some individuals, it can cause sexual dysfunction and testicular pain which resolve on stopping the drug and recur when the patient is challenged again with the drug.

Cremasteric spasm is of unknown cause. It can be treated by excision of the cremasteric muscle and interruption of the genital branch of the genitofemoral nerve.

Genitofemoral neuralgia causes intermittent or constant inguinal, testicular, and upper medial thigh pain. The pain is increased by walking, stooping, or extension of the hips and is decreased by hip flexion and bed rest. The inguinal canal may be tender. Neuralgia results from nerve entrapment following appendectomy or a hernia repair. Neurectomy of the genitofemoral nerve within the abdomen brings relief. Bilateral involvement may occur. Some cases are idiopathic.

Ilioinguinal neuralgia causes inguinal, testicular, and low back pain. Tenderness occurs medial to the anterosuperior iliac spine. There is limitation of internal rotation of the hips and extension. Hypesthesia may occur in the inguinal area. Nerve blocks may relieve the pain.

Nodular fibrositis causes low back pain relieved by injection of the subcutaneous mobile nodule with lidocaine and methylprednisolone. Rarely, palpation of such a nodule can reproduce testicular pain.

Iliac artery aneurysm may be associated with inguinal and testicular pain and a pulsatile unilateral lower abdominal mass.

Acute appendicitis can cause left- or right-sided testicular and inguinal pain as purulent material spreads to the dependent portions of the inguinal canal. Abdominal pain is associated with the testicular pain. The testicle may be drawn up into the scrotum. This more commonly occurs with torsion or epididymo-orchitis.

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